Subject: Staff response to questions provided by Hearing Officer Kramer regarding the desert tortoise. Staff reviewed a variety of resources in the preparation of the responses provided below. Staff reviewed existing literature, contacted the USFWS Desert Tortoise recovery Office in Reno Nevada, and coordinated with BLM and CDFG biologists.

Question 1. How many tortoises are estimated to exist (rough estimates of individuals) and how many population centers or major groups exist? What constitutes a population center or major group? Where?

Staff Response to Question 1. There is a variety of on-line and literature based data that provide estimates describing the total number of tortoises that may exist on a range wide basis. For example, the Defenders of Wildlife website indicate the total tortoise population is approximately 100,000 animals (http://www.defenders.org/wildlife_and_habitat/wildlife/desert_tortoise.php?gclid=COv4wPWy0KMCFSFVgwodUFRndQ). Similarly, the West Mojave Plan (BLM 2005) indicates that between 229,666 and 426,361 tortoises may occur within the Western Mojave Desert.

Because of the absence of thorough on the ground sampling the USFWS indicates there is no accurate range-wide estimate of desert tortoise numbers available. Range-wide tortoise estimates are only available within the areas that have been surveyed in the USFWS range-wide monitoring program over the last several years or in areas which may have been subject to other research. The 2007 monitoring report posted on the Desert Tortoise Recovery Office (DTRO) website contains the most recent estimates within these areas. In particular, Table 9 of this report includes density estimates for each of the recovery units that were sampled in 2007. This extrapolates to approximately 130,990 tortoises within the 28,483-acre sample area.

Estimated density of desert tortoises in monitored areas of each recovery unit in the Mojave Desert in 2007*

Recovery Unit	Monitored area (km2)	Transects	Tortoises detected	Density (/km2)	% change from 2005b
Eastern Colorado	4263	100	59	5.0	-37
Eastern Mojave	6681	76	40	5.8	-20
Northeastern Mojave	4089	240	46	1.7	-9
Northern Colorado	4038	15	7	4.6	-58
Western Mojave	9298	97	49	4.7	-23
Upper Virgin Rivera	114	157	92	14.9	-32

*Data from the "Range-wide Montiroing of the Mojave Population of the Desert Tortoise: 2007 Annual Report", Linda Allison, Desert Tortoise Monitoring Coordinator, U.S. Fish and Wildlife Service

In conclusion, it may not be possible to provide a reliable estimate of the number of tortoises that exist within their range. However, the USFWS and CDFG evaluate threats to this species based on population trends and indentified threats such as habitat loss, development, and habitat degradation.

Question 2. What is the approximate total acreage of prime tortoise habitat (occupied and also that which could be occupied)?

Response to question 2. The USFWS has indicated that there is currently have no means of quantifying desert tortoise habitat quality. That is, quantitative habitat metrics that correspond to tortoise population size, individual growth rates, reproductive output, etc. have not been developed. The USGS habitat model is the best available tool for quantifying potential desert tortoise habitat across the landscape. The USGS study encompassed the range of the desert tortoise which included approximately 336,594 km2. Habitat within this range was classified using a numerical ranking system from 0 to 1 with 1 indicating the highest quality habitat. The system also included a Non Estimable value. Results form these surveys are highlighted below:

Habitat Potential Index	Area in Km2
1	677
0.9	27,303
0.8	31,216
0.7	23,835
0.6	15,191
0.5	12,880
0.4	13,119
0.3	14,612
0.2	15,100
0.1	30,493
0	147,249
Non Estimable	4,919
Total	336,594
Source: USGS Modeling Habitat of the Desert Tortoise	

Question 3. What are the main reasons for listing the desert tortoise? What is the status of the species since listing (i.e., has the population increased or decreased)?

Response to Question 3. The Mojave population of the desert tortoise (all tortoises north and west of the Colorado River in Arizona, Utah, Nevada, and California) was listed as Threatened on April 2, 1990. The species was listed due to range wide population declines. The Draft Revised Recovery Plan indicates that the threats include the loss or modification of habitat; overutilization for commercial, recreational, scientific, or educational purposes; disease and predation; inadequacy of existing regulatory mechanisms; and other natural or manmade factors such as global climate change, hunting, off-highway vehicle use, shooting, camping etc. Further information is also available on the DTRO webpage.

Question 4. Since listing, how many take permits have been issued and what have been the affects of mitigation to minimize impacts?

Response to Question 4. The West Mojave Plan indicated that 130 Biological Opinions where issued between 1990 and 1995; however that number is likely out of date. The number of Biological Opinions issued since that date was not available from the USFWS; however the USFWS indicated the effects of mitigation to minimize impacts have not been well studied. Currently, staff does not have access to CDFG records regarding the number of take permits that have been issues. The USFWS has indicated that recent scientific reviews have found that existing recovery/mitigation actions are appropriate, but better information is needed to determine how effective they are or which actions are most/least effective. Additional information to this effect is also discussed in the revised recovery plan.

Question 5. What is the range of population density per acre? How does this project's site compare? What is the maximum carrying capacity per acre for prime habitat, non-prime and marginal lands?

Response to Question 5. The range of tortoise densities can vary greatly between sample areas. Some habitat within the range no longer supports populations of desert tortoises while densities within occupied territories range greatly. The 2007 Range-wide monitoring report indicated that tortoise densities on their study sites ranged from 1.2/km2 to 8.2/km2. Within recovery units tortoise densities ranged from a low of 1.7/km2 in the Northeastern Mojave to a high of 14.9 in the Upper Virgin River area in Utah. The Calico project area supports an average of 3.69 tortoises/km2. This includes localized areas of extremely high tortoise density and some areas supporting few if any tortoises. However, the proposed linkage area now excluded from the project supports a density of 8.2/km2. For the western Mojave the project supports a higher tortoise density than many other areas (see Table 8 of Range-wide monitoring Plan).

The USFWS has stated that the concept of carrying capacity is not well defined (it may not be definable) for the desert tortoise. Given that we do not have quantitative metrics of habitat quality, we cannot currently relate population sizes to specific habitat variables. Furthermore, high variation in habitat characteristics such as vegetation production will be difficult to correlate with desert tortoise population size since tortoise populations do not experience the same degree of fluctuation.

Question 6. What is the range of the desert tortoise? What importance does this site play in that range?

Response to Question 6. The USFWS Draft Recovery Plan for Desert Tortoise indicate that range of desert tortoise occurs in the Mojave and Sonoran deserts of southern California, southern Nevada, Arizona, and the southwestern tip of Utah in the United States, as well as Sonora and northern Sinaloa Mexico. The Calico site is important within the range of the tortoise because it occurs within an important intersection between recovery units and the site likely acts as a conduit for gene flow and movement between the eastern and western Mojave Desert. This is important for tortoise recovery due to its relatively high density and its position between core areas of tortoise conservation. The USFWS

has indicated that populated landscapes between the USFWS conservation areas are important for long-term gene flow and in preventing more intensively managed conservation areas from becoming isolated and subject to genetic or demographic impacts.

Question 7. What is the value of this site relative to other sites of BLM and non-BLM managed lands?

Response to Question 7. The project area supports a high density of desert tortoise and is located in an area that has been identified as an important linkage area between the Eastern and Western Mojave Deserts.